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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/382,929	08/25/1999	PAUL A. FARRAR	303.603US1	5871

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EXAMINER

GRAYBILL, DAVID E

ART UNIT PAPER NUMBER

2827

DATE MAILED: 12/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/382,929

Applicant(s)

FARRAR, PAUL A.

Examiner

David E Graybill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-10,12,14,15,18-23,31-36 and 38-46 is/are pending in the application.
- 4a) Of the above claim(s) 15,32 and 36 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-6,8-10,12,14,18-23,31-35 and 38-46 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Claim 32 is withdrawn from further consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

In the rejections infra, reference labels are generally recited only for the first recitation of identical claim language.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 4, 5, 6, 8-10, 12, 14, 18, 20-23, 31 and 33-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Juengling (6333556).

At column 1, lines 31-49, column 3, line 17 to column 4, line 62, column 5, lines 18-30, column 6, lines 4-44, column 7, lines 13-16, and column 7, line 47 to column 8, line 19, Juengling teaches all the essential elements of claims 1, 4, 5, 6, 8-10, 12, 14 and the following:

18. An integrated circuit assembly comprising: an electronic chip 12g; a support structure 34, 70, 72, 74, 76, 78 mounted on the electronic chip, the support structure having an interstice and a vaporization temperature; a material [carbon] filling the interstice, the material having a vaporization temperature that is less than the vaporization temperature of the support structure; a connective structure 32g mounted on the support structure; and a conductive structure 50, 52, 54, 56, 58, 60, 62, 64 capable of coupling the electronic chip to the connective structure, the conductive structure embedded in the support structure and the material.

20. The integrated circuit assembly of 18, wherein the support structure is fabricated from silicon dioxide.

21. The integrated circuit assembly of 18, wherein the support structure is a ribbed structure.

22. The integrated circuit assembly of 18, wherein the material is carbon.

23. The integrated circuit assembly of 18, wherein the connective structure is a controlled collapse chip connection (C4) structure.

31. An integrated circuit assembly comprising: an electronic chip; and a post structure 52, 60, 72, 76 mounted on the electronic chip and capable of protecting an air-bridge structure and supporting a C4 structure.

33. The integrated circuit assembly of 31, wherein the post structure is mounted on an insulating base formed on the electronic chip.

34. The integrated circuit assembly of 31, wherein the post structure is fabricated from an insulator.

35. The integrated circuit assembly of 34, wherein the insulator is silicon dioxide.

To further clarify the teaching that the conductive structure is coupled to the electronic chip, it is noted that the conductive structure is fastened together and linked with the chip; therefore, it is coupled to the chip.

To further clarify the teaching of a conductive structure capable of coupling the electronic chip to the connective structure, it is noted that the conductive structure couples the chip to the connective structure; therefore it is capable of coupling the chip to the connective structure.

To further clarify the teaching that the post structure is capable of protecting an air-bridge structure and supporting a C4 structure, and the connective structure is a controlled collapse chip connection (C4) structure, these statements of intended use do not result in a structural difference between the claimed product and the product of Juengling. In addition, because the post structure and connective structure of Juengling are inherently capable of being used for the intended uses, in particular, to protect an air-bridge structure, to support a C4 structure, and as a (C4) structure [structural element], the statements of intended use do not patentably distinguish the claimed product from the product of Juengling. Claims directed to product must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

Still further, it is noted that the scope of the limitation "C4 structure" encompasses a structure used in controlled collapse chip connection.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Juengling (6333556) and Farrar (5994777).

Juengling is applied for the same reason it was applied to claim 1.

However, Juengling does not appear to explicitly teach the following:

2. The integrated circuit assembly of 1, wherein the electronic chip is a memory chip.

3. The integrated circuit assembly of 2, wherein the memory chip is a dynamic random access memory chip.

Nevertheless, at column 13, lines 4-9, Farrar teaches a dynamic random access memory chip ["DRAM"]. Furthermore, it would have been obvious to substitute the chip of Farrar for the chip of Juengling because it would provide a chip.

Claims 38-42 and 44-46 are rejected under 35 U.S.C. 102(e) as being anticipated by Clevenger (6255712).

At column 4, line 29 to column 6, line 39, Clevenger teaches the following:

38. An integrated circuit assembly comprising: an electronic chip 0 including a plurality of electronic devices 2; a plurality of conductive segments 8 capable of interconnecting the plurality of electronic devices, each of the plurality of conductive segments having a surface area in contact with a material having a dielectric constant of about 1; a C4 connection 13 coupled to the electronic chip through the

plurality of conductive segments; and a substrate 15 coupled to the C4 connection.

39. The integrated circuit assembly of 38, wherein the integrated circuit assembly is hermetically sealed.

40. The integrated circuit assembly of 39, wherein the integrated circuit assembly is back filled with helium.

41. The integrated circuit assembly of 39, wherein the integrated circuit assembly is back filled with a helium rich gas mixture.

42. The integrated circuit assembly of 38, wherein the material is air.

44. The integrated circuit assembly of 38, further comprising a heat sink 19 coupled to the electronic chip.

45. The integrated circuit assembly of 44, wherein the integrated circuit assembly is hermetically sealed.

46. The integrated circuit assembly of 45, wherein the integrated circuit assembly is back filled with helium.

To further clarify the teaching of a C4 connection 13 coupled to the electronic chip through the plurality of conductive segments, it is noted that this statement of intended use of the connection 13 does not result in a structural difference between the claimed product and the product of Clevenger. Further, because connection 13 of Clevenger is

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inherently capable of being used for the intended use as a C4 connection coupled to the electronic chip through the plurality of conductive segments, the statement of intended use does not patentably distinguish the claimed product from the product of Clevenger.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Clevenger (6255712) and Farrar (5994777).

Clevenger does not appear to explicitly teach the following:

19. The integrated circuit assembly of 18, wherein the electronic chip is a dynamic random access memory chip.

Nonetheless, as cited supra, Farrar teaches a dynamic random access memory chip. Moreover, it would have been obvious to substitute the chip of Farrar for the chip of Clevenger because it would provide a chip.

Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clevenger (6255712).

Clevenger does not appear to explicitly teach as the invention of Clevenger the following:

43. The integrated circuit assembly of 38, wherein the material is a foam.

Still, at column 1, lines 30-38, Clevenger teaches that a foam material is well known. Furthermore, it would have been obvious to substitute the well known foam material for the material of Clevenger because it would provide a material.

Applicant's amendment and remarks filed 9-23-2 have been fully considered, are addressed in the rejection supra and are further addressed infra.

Applicant contends that the applied prior art does not teach the relevant C4 limitations. This contention is respectfully traversed for the reasons further clarified supra. In addition, it is respectfully submitted that the chips of the applied prior art are capable of being used as C4 chips; therefore, it is inherent that the relevant prior art chip structures and connections are intermediate product C4 structures and connections.

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS

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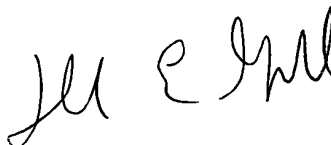
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of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 703-306-3329.

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/308-7722.



David E. Graybill
Primary Examiner
Art Unit 2827

D.G.
6-Dec-02